Before the

FEDERAL COMMUNICATIONS COMMISSION

Washington DC

In the matter of:	)	
	)	**MM Docket 99-25**
Establishment of a Low Power	)	RM-9208
Radio Service	)	RM-9242
	)	

AMENDMENT TO COMMENTS FROM REC NETWORKS

In this amendment to our comments, we submit an extensive research study that was conducted by REC ("REC") Networks on the nationwide availability of channels for use in the proposed Low Power Radio Service.

Respectfully Submitted,

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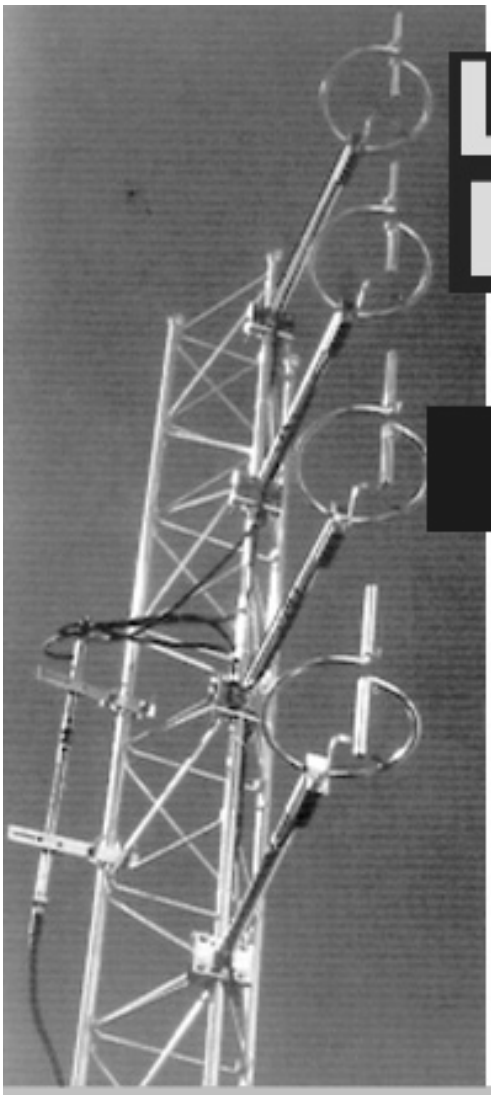
July 16, 1999



Low Power FM Radio Nationwide Channel Availability

A research project on the availability of channels for assignment for the Low Power Radio Service (LPRS) proposed by the FCC in Mass Media Docket

99-25

This document was prepared by REC Networks-LPFM Project

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OVERVIEW

In this report, we look further into the logistics and impact to the FM broadcast spectrum as a result of the establishment of the Low Power Radio Service.

This report utilizes the REC SuperCoordinator computer program, which was designed specifically for this report. The SuperCoordinator attempted to place three LPFM stations in each community designated by the US Census Department records at the geographic coordinates on file at the Census Bureau. Each state was ran as a separate report, some smaller states were ran together. Channels were selected in the order of population. Communities with higher populations were given first opportunity at channels.

The three different channels included:

- A channel in the commercial (92-108) band at the highest power level available to the community. Of course, REC encourages stations to license at the lower power levels whenever possible, but this report gives you an idea of what is possible.
- A 10 watt "community/high school" channel. This is the channel that we described in our comments for use by high schools and other community groups on a time-share basis. Whenever possible, we assigned the frequency **87.5** (Channel 198D2) for this type of service. If 87.5 was not available, we took any channel available giving priority to a lower power channel. For example, if there was two channels available, a channel capable of 1kW and a second channel capable of 100w, we would have taken the 100w channel for the high school station.
- A channel in the non-commercial (87.7-92) band at the highest power level possible.

HOW THE SUPER-COORDINATOR ASSIGNED CHANNELS

For this search, the Super-Coordinator took each community (in order of population size) and did a full channel search. The channel search used the following parameters:

- Second adjacent channel and IF channels excluded for 100W (A3/D1) and 10W (D2) results.
- Third adjacent channels excluded for all LPFM classes.
- Translators (local and distant) were included in the search and were fully protected using the formula shown in the REC comments.
- 1000W (A1) were excluded in the Top-100 media markets.
- 250W (A2) were excluded in the Top-50 media markets.

The computer program first makes all of the channels in the broadcast band "available", then it takes a sweep of the FCC database in effect as of the date of the NPRM for 99-25. Using the distance spacing guidelines proposed by REC and the FCC, the system then eliminates channels which would interfere with or be interfered by full power stations, translators (local and distant) and boosters. The system then goes into a database of Channel 6 stations to determine if 87.5-87.9 is available to the specific community. Protection guidelines for Channel 6 are also mentioned in the REC Comments.

The system would then go into a database of LPFM stations that have already been pre-coordinated by the SuperCoordinator and mark any interfering channels as unavailable.

The SuperCoordinator will then search for available channels using the following formulas:

- If outside a top-100 media market, check 92.3 through 107.9 for an available 1000W channel that can not be assigned to a full power Class-A or higher station. Assign 92.1 as a last resort. *If no channel is available...*
- If outside a top-100 media market, check 92.3 through 107.9 for an available 1000W channel, even if it can be used as a Class-A. Use 92.1 as a last resort. *If no channel is available...*
- If outside a top-50 media market, check 92.3 through 107.9 for an available 250W channel. Use 92.1 as a last resort. *If no channel is available...*
- In all media markets, check 92.3 through 107.9 for an available 100W channel. Use 92.1 as a last resort. *If no channel is available, we will try for a 10w channel but we give high school/community stations the first opportunity.*
- The SuperCoordinator will check 87.5 through 107.9 for an available 10W channel for high school and community use. First priority will be given to a channel with a 10w maximum, if no 10w only channels are available, we will assign 10w operation on a 100w channel. If no channels are available, we will then go to 250w, then 1000w and then Class-A channels.
- Once the SuperCoordinator assigns the high school/community channel and if no commercial band channel has been assigned, we will attempt to find another 10w channel in the 92-108 band and assign it.
- We will search for a non-commercial band (88-92) channel using the same selection process we used for commercial band. (1000W, then Class-A, then 250, 100 and finally 10W).

Not all communities will be assigned channels.

EXECUTIVE SUMMARY

Here are some of the basic findings from the report:

Census facts...
This report was run using a national population of 184,997,011 based on the 1990 Census. There are 23,953 census designated places, cities, towns, buroughs, villages and other municipal entities.

Availability of a "commercial band" channel.
Out of the 23,953 communities in the USA, REC was able to place LPFM stations on the commercial band in 15,147 communties representing a population of 112,318,517. This is just over 60% of the US Population. Of the 15,147 channels pre-coordinated, 3,748 (24.7% of the total population) are capable of a maximum 1000W (A1/LP-1000) operation. 2,158 (14.2% of the total population) are limited to 250W. 2,472 (16.3%) stations are located in the Top-50 metropolitan areas and are limited to 100 watts. Outside the Top-50 areas, we can place 3,659 (24.2% of the total population) stations. This makes a total of 6,131 100w stations. We also have 3,110 10 watt stations available.

High School/Community Channels
A key part of REC's plan is to place a 10 watt channel in as many communities as possible to be used by high schools, churches, small colleges and other community groups on a time-share basis. Out of the 23,953 communities searched, we have been able to assign one of these channels in 18,114 communities representing 70.2% of the population. Of those 18,114 stations, we were able to place 7,578 stations on Channel 198 (87.5 MHz).

Non-Commercial portion of the band
In this part of the band, we were not able to place as many stations as we would like to. Due to the fact that we only have 4 MHz within this sub-band and due to the high number of translators (including distant translators or "satellators"), we were only able to place 7,671 stations representing 22% of the total population. REC has proposed that if there are no channels available, then an LPFM station can displace a distant translator (primary station more than 400km away from translator). The SuperCoordinator search did NOT make a second run to exclude distant translators therefore more NCE band channels may be available.

Channels below 88 MHz.
In REC's comments, we proposed the assignment of 87.5 through 87.9 for FM sound broadcasting. For interference protection, we considered a full power channel 6 station as a Class-C station on 87.7, LPTV stations were classified as Class-A on 87.7. We have also placed a 300km protection contour around New Haven, CT and Juneau, AK as a result of those two communities having Channel 6 DTV stations on the Table of Allotments. REC has recommended that stations operating below 88 MHz be limited to 10 watts and are secondary to NTSC-TV, DTV and *incumbent* LPTV stations on Channel 6. We were able to place 7,578 stations on 87.5, 254 stations on 87.7 and 1,870 on 87.9 MHz. Remember, that 87.9 is also subject to first adjacent channel protection to stations on 88.1 MHz. REC has found that most manufacturers have radio receivers of all types that are capable of receiving 87.5 MHz. Of those that are not, they are capable of receiving channels as low as 87.7 and a small number of older digital FM radios can only go down to 87.9 MHz. In the NPRM, the Commission expressed concern about assigning additional spectrum for a Low Power Radio Service due to potential consumer hardships. Based on the information that we have submitted, we feel that consumers are already capable of receiving these channels (87.5, 87.7 & 87.9) on their existing receivers so therefore the assignment of these channels would not cause a consumer hardship.

Media Markets

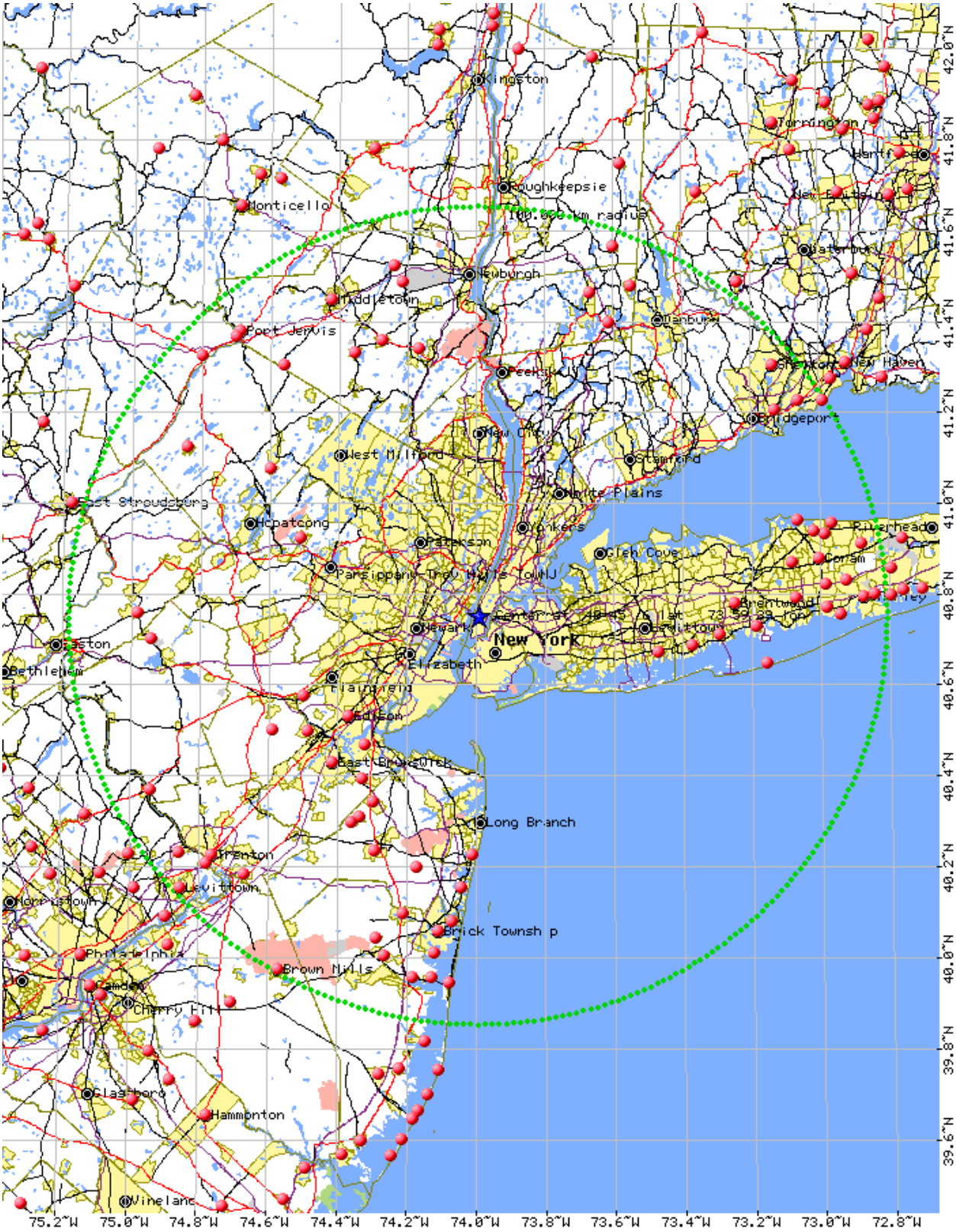
In REC's comments, we identified 100 metropolitan communities and placed a 100 km contour around these communities. In the Top-50 markets, we are asking that no 1000w or 250w be assigned in these areas and that 100w stations would be given primary status. In the Second-50 (51-100) markets, we asked for a prohibition on 1000w stations. Based on these restrictions that we proposed, we have found that 1000 watt stations would be available to 19.58% of the US population. The actual land mass that encompasses the area outside the Top-100 markets is very large but also very rural. 250 watt stations would be available outside the Top-50 markets and would therefore be available to 42.02% of the population.

The maps on the following pages detail the 100 km contour around markets #1 through #10 of our defined Top-100 Media Markets.

The red dots indicate the availability of channels in the FM broadcast band between 88.1 through 107.9 MHz. Channels below 88 MHz (87.5, 87.7, 87.9) may also be available.

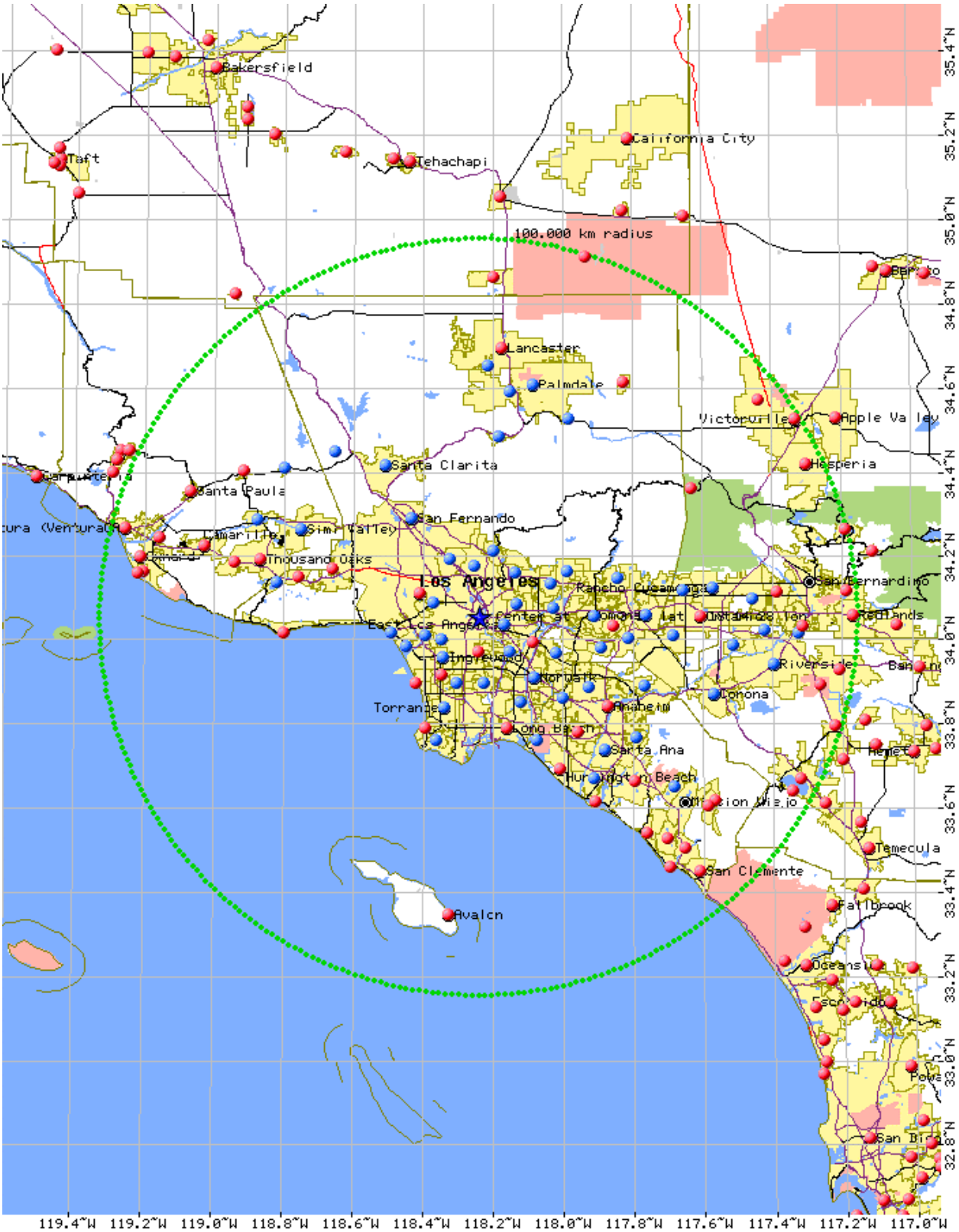
The blue dots indicate communities where only channels below 88 MHz are available.

1-NEW YORK MEDIA MARKET



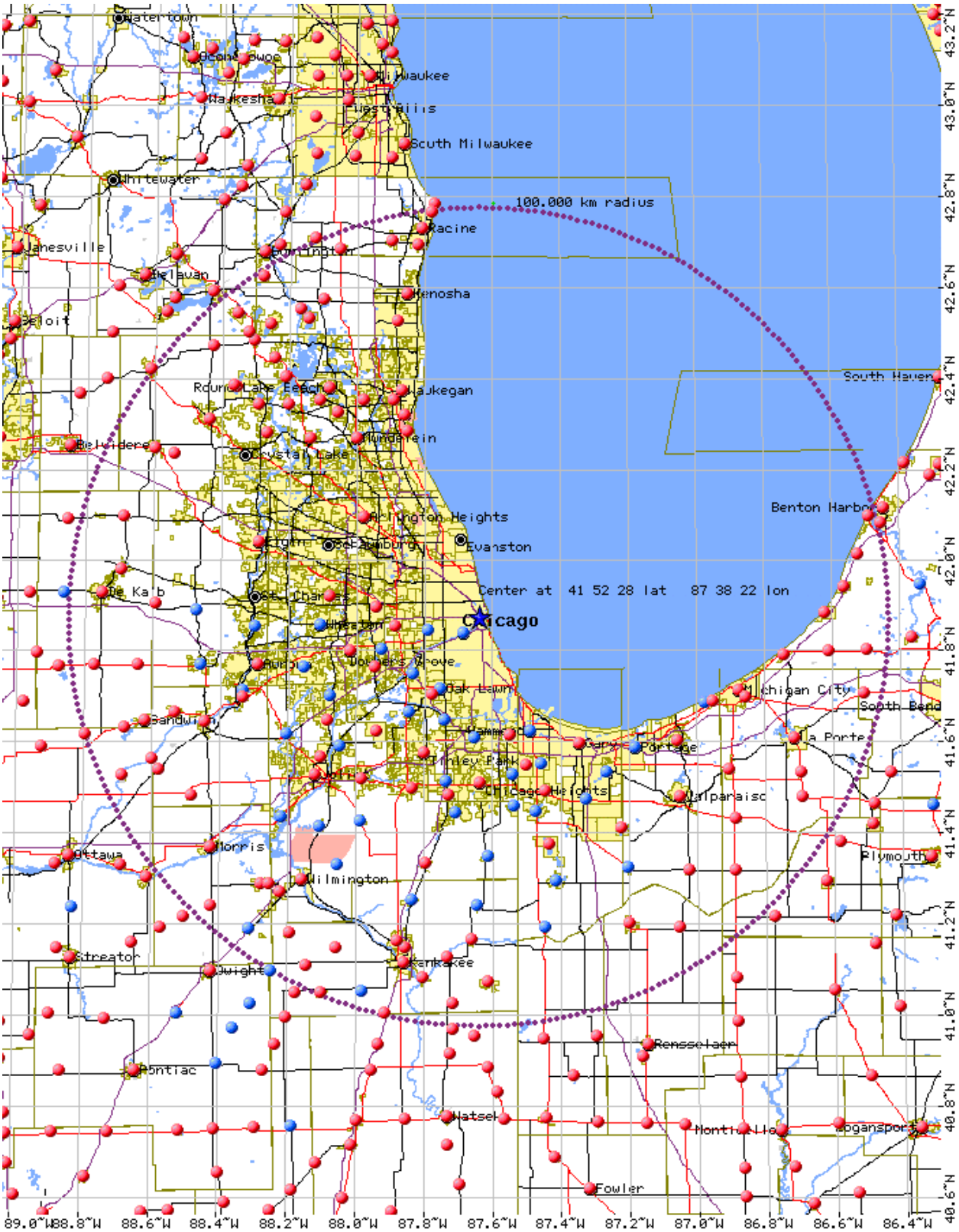
RED DOTS indicate communities which have at least one LPFM channel available.

2-LOS ANGELES MEDIA MARKET



RED DOTS indicate communities where at least one LPFM station has been pre-coordinated.
BLUE DOTS indicate communities where only 87.5-87.9 is available.

3-CHICAGO MEDIA MARKET

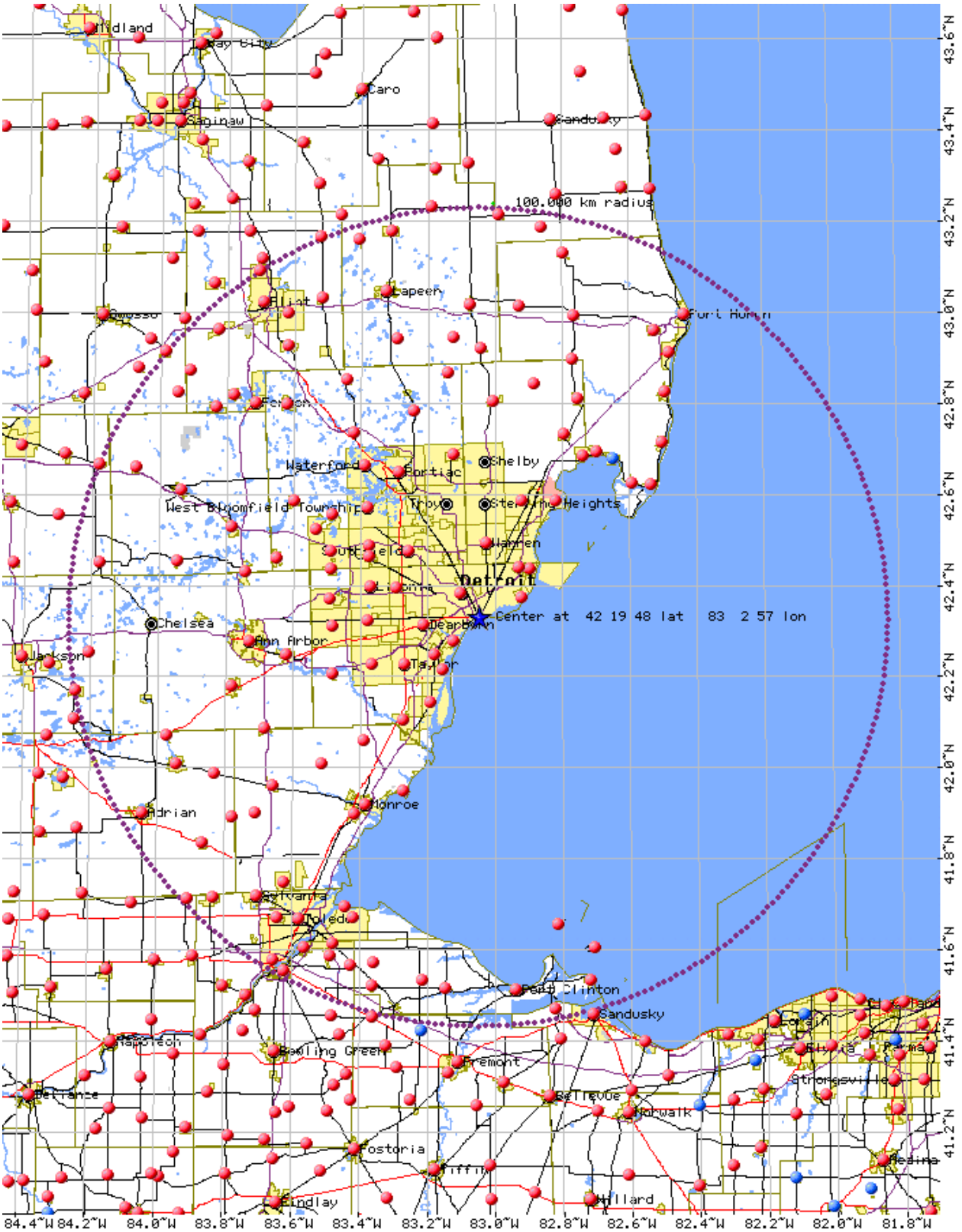


RED DOTS indicate communities where at least one LPFM station has been pre-coordinated.
BLUE DOTS indicate communities where only 87.5-87.9 is available.

4-PHILADELPHIA MEDIA MARKET

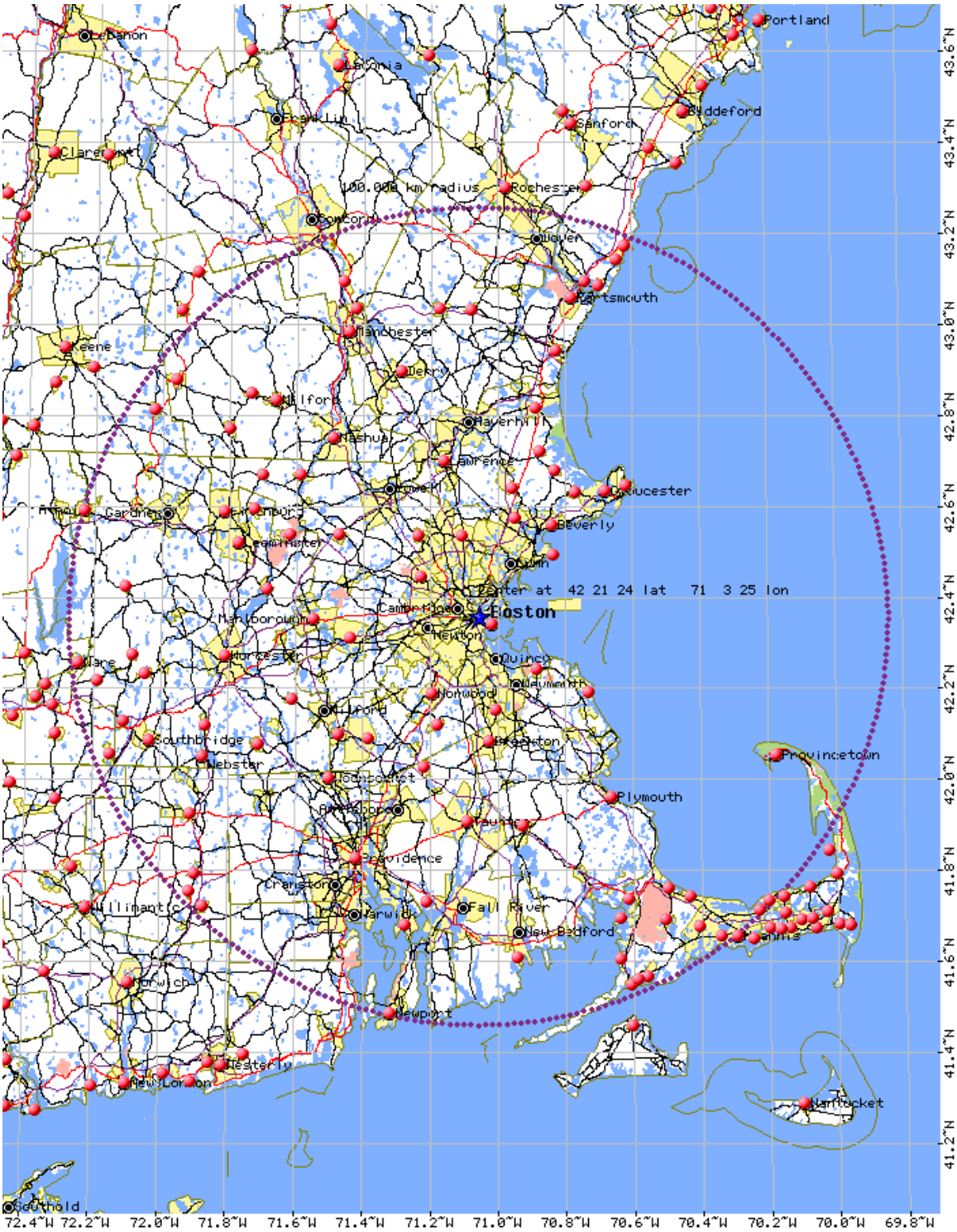
RED DOTS indicate communities where at least one LPFM station has been pre-coordinated.
BLUE DOTS indicate communities where only 87.5-87.9 is available.

5-DETROIT MEDIA MARKET

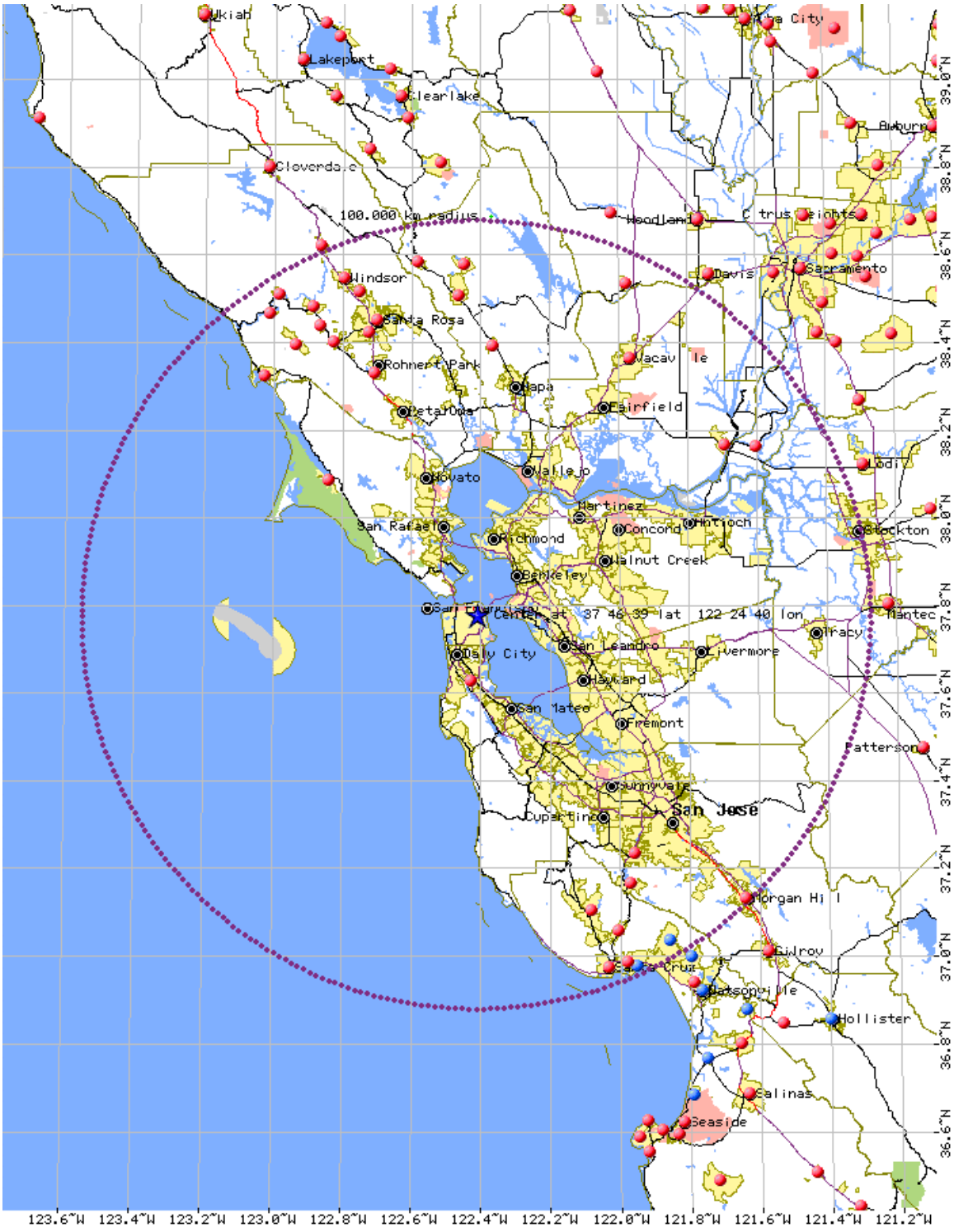


RED DOTS indicate communities where at least one LPFM station has been pre-coordinated.
BLUE DOTS indicate communities where only 87.5-87.9 is available.

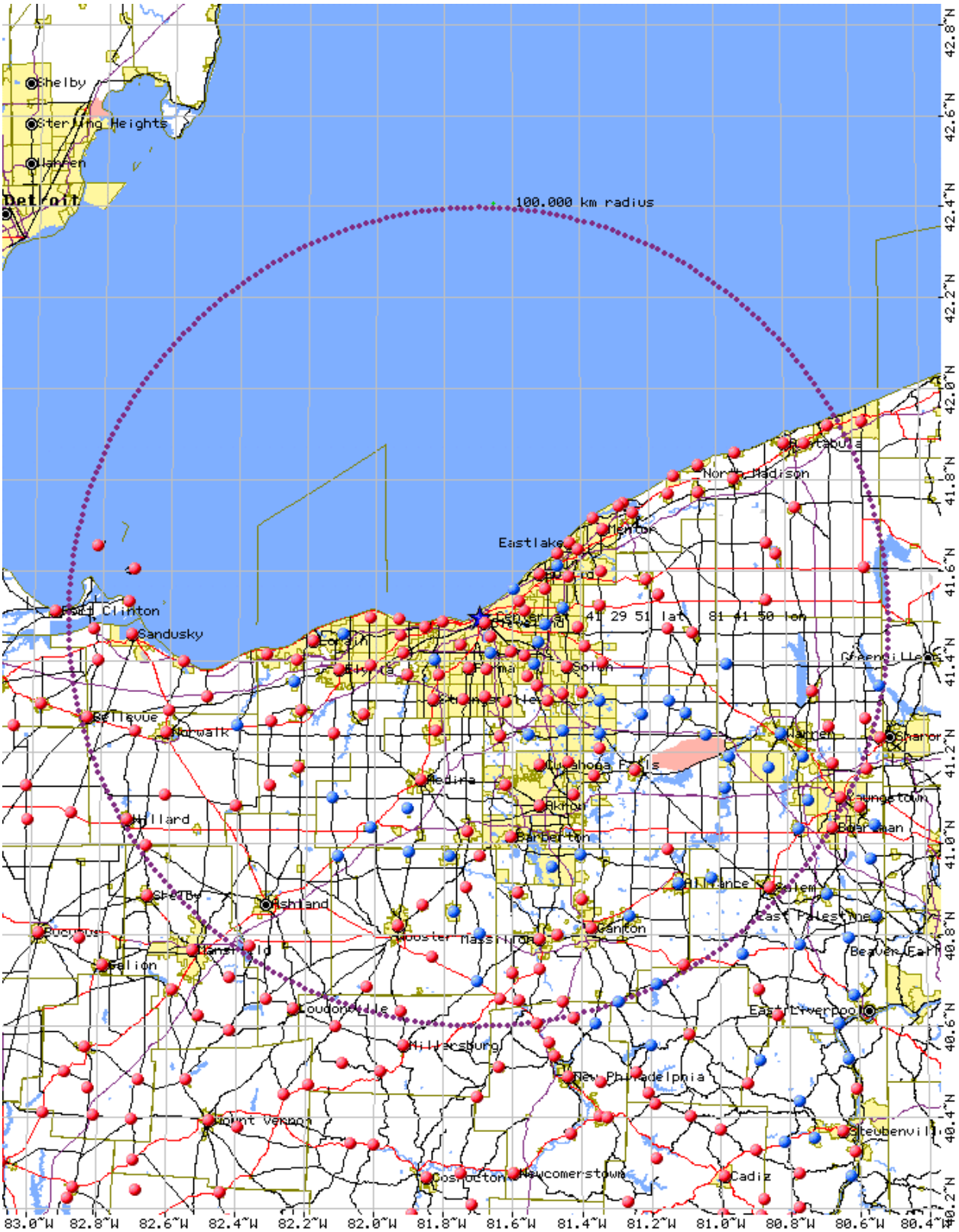
6-BOSTON MEDIA MARKET



7-SAN FRANCISCO MEDIA MARKET

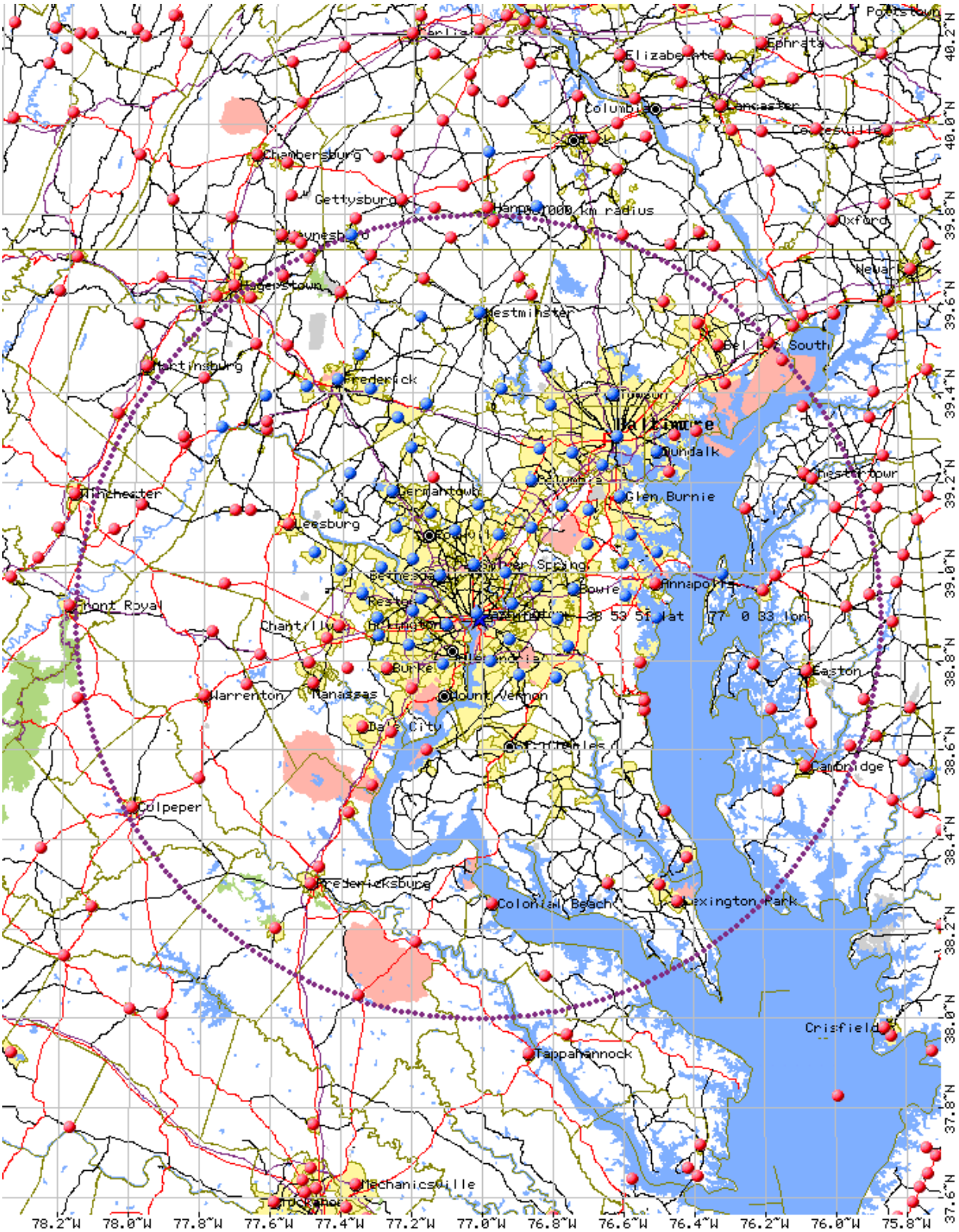


8-CLEVELAND MEDIA MARKET

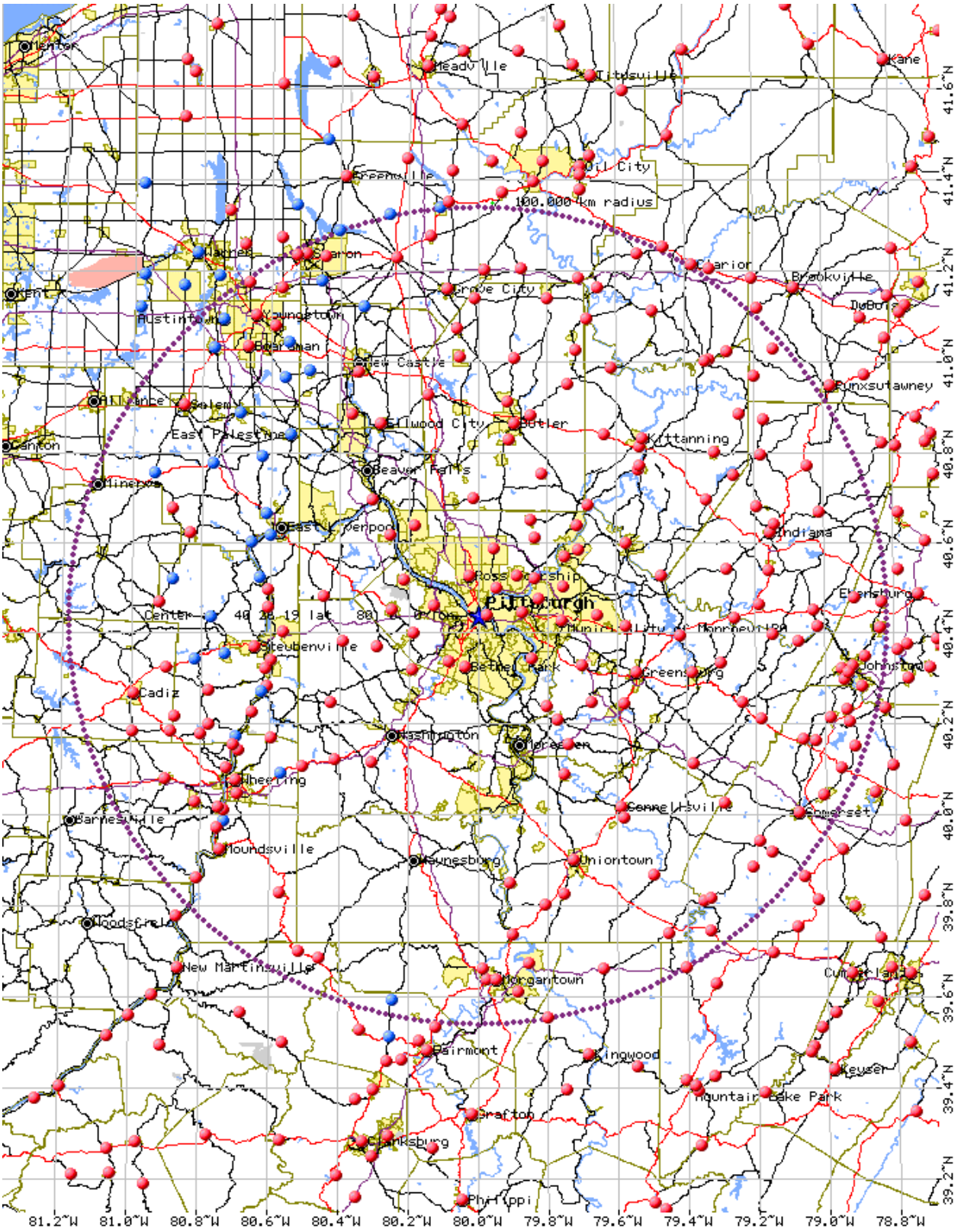


(NOTE: ONLY OHIO STATIONS SHOWN ON THIS MAP)

9-WASHINGTON MEDIA MARKET



10-PITTSBURGH MEDIA MARKET



CHANNELS 198, 199 AND 200.

REC has conducted several checks of commercially available FM radio receivers by visiting stores engaged in the sales of consumer electronics.

We had found that most major manufacturers currently market radio receivers, which are capable of receiving Channels 198, 199 and 200 (87.5, 87.7 and 87.9). These types of receivers range from the small portable "walkman" type headset radios up to the high end component receivers. We have also found that most major automobile manufacturers, both import and domestic, also have radio receivers capable of receiving these channels.

Some older digital receivers as well as a few brands, such as Magnavox, can tune Channels 199 and 200, but not 198.

Analog "slide rule" tuners are designed to have a "buffer" on each side of the dial in order to ensure that the receivers can tune the intended channels (88-108) and therefore most analog receivers can tune as low as Channel 198.

The reason why most manufacturers have radios capable of going as far down as 87.5 is because in some countries, FM channels are assigned that low. According to the World Radio TV Handbook, many European nations use channels between 87.5 and 87.9.

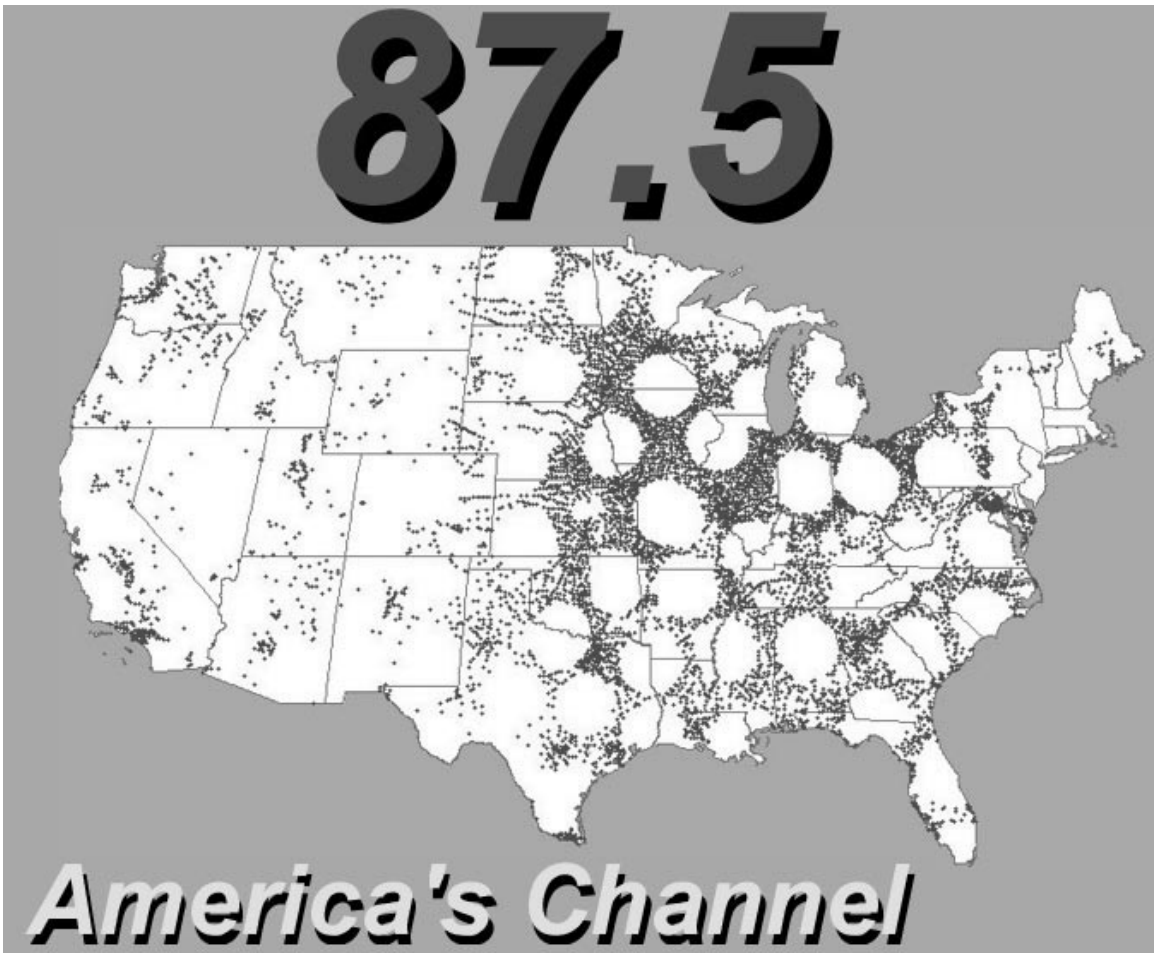
The only differences between radios manufactured for Europe and those manufactured for the USA (and other ITU Region 2 nations) is the chip or diode settings placed inside the radios which allow either 9 kHz AM/100 kHz spacing (for Regions 1 & 3) or 10 kHz AM/200 kHz spacing (for Region 2).

In conclusion, we have shown that allocating channels 198, 199 and 200 at this time for 10 watt LPFM stations in areas where interference to TV Channel 6 is not an issue is a viable option which would not result in a consumer hardship due to the availability of receivers. We estimate of every household which has an FM receiver, at least 95% of these households already have radios that receive Channels 198, 199 and/or 200.

The availability of Channel 199 (87.7) is extremely limited because the aural carrier of TV Channel 6 is at 87.75 and REC recommends Class-C co-channel protection for full power TV stations operating on Channel 6.

The availability of Channel 200 (87.9) would also be limited due to required protection to FM stations operating on Channel 201 (88.1).

The map on the following page shows all of the communities in the United States, which can be assigned a 10 watt LPFM station on Channels 198:


87.5
America's Channel

CONCLUSIONS

With the exception of New York and San Francisco, LPFM channels are widely available in the major metropolitan areas as long as stations within the Top-50 areas are limited to 100 watts.

The availability of 87.5 through 87.9 is vital in order to establish an urban LPFM service in areas like Los Angeles, Chicago and Washington D.C.

NTSC Channel 6 stations should not be permitted to return to their previous allotment after the DTV conversion. This will make 87.5 through 87.9 available to major metro areas like New York and San Francisco as well as pave the way for a possible future post-digital LPFM band between 82-88 MHz.

Higher powered 1kW and 250w LPFM stations will be available in many rural areas. Even though there is a large area where 1kW stations would be available, it only represents 19% of the population.

87.5 is available in over 7,000 communities and could be used in these communities by educators, churches and community groups.

Radios that receive the proposed Channels 198, 199 and 200 are already available on the market and have been available for years. We figure that over 95% of the FM households have a radio capable of receiving these channels and therefore, there would be no consumer hardship.

THE FULL FREQUENCY COORDINATION STUDY IS ENCLOSED IN A SEPARATE FILE.....